AMENDMENTS TO THE CLAIMS

Please amend the claims as follows:

1. (Previously Amended) A light emitting diode (LED) module for mounting on a heat conducting surface that is substantially larger than the module, the module comprising:

a plurality of LEDs, each LED having at least one lead; and

a circuit board, the circuit board comprising:

a thin dielectric sheet;

a plurality of electrically-conductive contacts on a first side of the dielectric sheet, each of said plurality of contacts being configured to mount a lead of an LED such that said plurality of LEDs is electrically connected; and

a heat conductive body on a second side of said sheet, said body having a first portion in thermal communication with the plurality of contacts through said dielectric sheet, said first portion of said body having a surface area substantially larger than a contact area between the contacts and the dielectric sheet, said body having a second portion adapted to provide thermal contact with the heat conducting surface, the second portion having a surface generally complementary to the heat conducting surface, whereby heat is transferred from the module to the heat conducting surface.

2. (Original) The LED module of Claim 1, wherein the contacts are substantially flat and coplanar relative to each other.

3. (Original) The LED module of Claim 2, wherein the plate is substantially flat and parallel to the contacts.

4. (Original) The LED module of Claim 1, wherein each of the contacts has a portion disposed generally adjacent an edge of the circuit board.

5. (Previously Amended) The LED module of Claim 4, wherein the plurality of LEDs are disposed adjacent one edge of the circuit board.

6. (Currently Amended) The LED module of Claim 5, wherein the LEDs additionally comprise lenses for directing light from the LED in a desired direction, and the LEDs are arranged so that light from the LEDs is directed generally parallel to the circuit board.

7. (Previously Amended) The LED module of Claim 1, wherein the number of contacts is greater than the number of LEDs.

8. (Previously Amended) The LED module of Claim 7, wherein the number of contacts is one greater than the number of LEDs.

9. (Previously Amended) The LED module of Claim 1, wherein the surface area of the first side of the body is greater than a combined surface area of one side of all of the contacts.

10. (Previously Amended) The LED module of Claim 1, wherein each of the contacts has a bonding area wherein at least one of the leads of an associated LED is attached to the contact.

11. (Original) The LED module of Claim 10, wherein an overall surface of each contact is substantially larger than the bonding area of the contact.

12. (Original) The LED module of Claim 1, wherein the heat conducting surface behaves as a heat sink.

13. (Original) The LED module of Claim 1, wherein the dielectric layer comprises an epoxy.

14. (Previously Amended) The LED module of Claim 1, wherein the body is bendable.

15. (Previously Amended) The LED module of Claim 1, wherein the body has a thermal conductivity greater than about 100 W/mK.

16. (Previously Amended) The LED module of Claim 15, wherein the body comprises a metal.

17. (Previously Amended) The LED module of Claim 16, wherein the body comprises aluminum.

18. (Previously Amended) The LED module of Claim 15, wherein the body is electrically non-conductive.

19. (Previously Amended) The LED module of Claim 1, additionally comprising an electrically non-conductive flexible film disposed adjacent the contacts on a side of the contacts opposite the body.

20. (Previously Amended) The LED module of Claim 19, wherein the film comprises reflective film, and the reflective film extends outwardly from the module beyond the LEDs.

21. (Original) The LED module of Claim 20, wherein the film is attached to the module with at least one rivet.

22. (Previously Amended) The LED module of Claim 20 in combination with a second strip of reflective film that is attached to the heat conducting surface adjacent an edge of the circuit board, and the plurality of LEDs is disposed adjacent the edge of the circuit board so that the LEDs are positioned between the first reflective film and the second reflective film.

23. (Original) The LED module of Claim 1, wherein the module comprises five pre-packaged, pre-focused LED lamps and six contacts, and the LED lamps are disposed adjacent an edge of the circuit board.

24. (Original) The LED module of Claim 23, wherein the module is about .05 inches thick, 1 inch long, and 0.5 inches wide.

25. (Previously Amended) A self-contained illumination apparatus comprising an LED module in combination with a heat conductive base plate having a mount tab, the LED module being mounted onto the mount tab, the module comprising:

a plurality of LEDs, each LED having at least one lead; and

a circuit board, the circuit board comprising:

a thin dielectric sheet;

a plurality of electrically-conductive contacts on a first side of the dielectric sheet, each of said plurality of contacts being configured to mount a lead of an LED such that said plurality of LEDs is electrically connected; and

a heat conductive body on a second side of said sheet, said body having a first portion in thermal communication with the plurality of contacts through said dielectric sheet, said first portion of said body having a surface area substantially larger than a contact area between the contacts and the dielectric sheet, said body having a second portion adapted to provide thermal contact with the heat conducting surface, whereby heat is transferred from the module to the heat conducting surface.

26. (Original) The self-contained illumination apparatus of Claim 25, wherein the LED module is mounted onto the mount tab with at least one rivet.

27. (Original) The self-contained illumination apparatus of Claim 25, wherein the base plate behaves as a heat sink.

28. (Original) The self-contained illumination apparatus of Claim 25 additionally comprising a housing substantially surrounding the LED module, the housing having a cavity, and the LED module positioned to direct light out of the cavity.

29. (Original) The self-contained illumination apparatus of Claim 25, wherein the apparatus is mounted on a substantially vertical mount surface.

30. (Original) The self-contained illumination apparatus of Claim 29, wherein the mount surface comprises an end surface of a row of seats.

31. (Previously Amended) A channel illumination device comprising a plurality of the LED modules in combination with at least one channel defined by a plurality of wall surfaces and a back surface, wherein the LED modules are mounted on at least one of the surfaces of the channel illumination device, and wherein each LED module comprises:

a plurality of LEDs, each LED having at least one lead; and

a circuit board, the circuit board comprising:

a thin dielectric sheet;

a plurality of electrically-conductive contacts on a first side of the dielectric sheet, each of said plurality of contacts being configured to mount a lead of an LED such that said plurality of LEDs is electrically connected; and

a heat conductive body on a second side of said sheet, said body having a first portion in thermal communication with the plurality of contacts through said dielectric sheet, said first portion of said body having a surface area substantially larger than a contact area between the contacts and the dielectric sheet, said body having a second portion adapted to provide thermal contact with the heat conducting surface, whereby heat is transferred from the module to the heat conducting surface.

32. (Original) The channel illumination device of Claim 31, wherein the plurality of LED modules are electrically connected in parallel relative to each other.

33. (Original) The channel illumination device of Claim 32, wherein the LED modules are spaced at least about ½ inch from a top surface of the walls.

34. (Previously Amended) The channel illumination device of Claim 32, wherein the wall and back surfaces are coated with a diffusely-reflective coating.

35. (Previously Amended) The channel illumination device of Claim 32, wherein the modules are arranged to direct substantially all of the light emitted by the LEDs toward the wall and back surfaces.

36. (Previously Amended) The channel illumination device of Claim 35, wherein the wall and back surfaces are coated with a diffusely-reflective coating.

37. (Previously Amended) The channel illumination device of Claim 31, wherein the at least one channel surface comprises a heat conducting surface.

38. (Previously Amended) A low profile modular lighting apparatus for conducting heat away from a light source of the apparatus and to a mounting surface, the apparatus comprising:

a plurality of light emitting diodes (LEDs); and

a circuit board comprising a thermally conductive main body and a plurality of electrically conductive contacts, each of the LEDs electrically communicating with at least one of the contacts in a manner so that the LEDs are configured in a series array;

wherein the plurality of contacts are arranged adjacent a first side of the main body and are in thermal communication with the first side of the main body, the main body electrically insulating the plurality of contacts relative to one another; and

wherein the circuit board is generally planar and a second side of the main body opposite the first side is generally flat to facilitate heat transfer from the main body to the mounting surface and so that the apparatus has a low profile upon the mounting surface.

39. (Original) The modular lighting apparatus of Claim 38, wherein the main body is electrically nonconductive.

40. (Original) The modular lighting apparatus of Claim 38, wherein the main body is electrically insulated from the contacts.

41. (Original) The modular lighting apparatus of Claim 40, wherein the main body is metallic.

42. (Original) The modular lighting apparatus of Claim 38, wherein the main body has a thermal conductivity greater than about 100 W/mK.

43. (Original) The modular lighting apparatus of Claim 42, wherein the contacts have a thermal conductivity greater than about 100 W/mK.

44. (Previously Added) The LED module of Claim 1, wherein the LEDs are configured to direct light in a direction generally coplanar with the circuit board.

The LED module of Claim 44, wherein the LEDs are arranged along a side edge of the circuit board.

46. (Previously Amended) The LED module of Claim 45, comprising LED packages that generally abut the side edge of the circuit board.

47. (Previously Added) The apparatus of Claim 38, wherein each of the LEDs electrically communicates with corresponding contacts at an attachment area defined on each contact, and an overall surface of the contact is substantially larger than the attachment area.

48. (Previously Added) A lighting apparatus, comprising:

a light emitting diode (LED) module mounted on a heat conductive base plate;

the LED module comprising:

a plurality of LED packages, each package comprising an LED and at least one lead; and

a circuit board, comprising a thin dielectric sheet, and a plurality of electrically-conductive contacts on a first side of the dielectric sheet, each of the plurality of contacts being configured to mount a lead of an LED package such that the plurality of LEDs is series connected;

the heat conductive base plate being configured to be mounted on a generally vertical surface and comprising a mount tab;

a housing disposed on the base plate and having a generally downwardly directed opening;

wherein the LED module is attached to the mount tab so that the dielectric sheet is disposed between the mount tab and the plurality of contacts, and the mount tab is in thermal communication with the plurality of contacts through the dielectric sheet, whereby heat is transferred from the LED module to the heat conductive base plate, and the base plate is sized and adapted to behave as a heat sink for the heat transferred thereto from the LED module; and

wherein the LED module is arranged so that the LEDs direct light through the generally downwardly directed opening through the housing.

49. (Previously Added) The lighting apparatus of Claim 48, wherein the LEDs are arranged to direct light generally in a direction coplanar to the mount tab.

50. (Previously Added) The lighting apparatus of Claim 49, wherein the LED packages generally abut a side edge of the mount tab.

51. (Previously Added) The lighting apparatus of Claim 50, wherein the mount tab is angled about 20-45° relative to a body of the base plate.

52. (Previously Added) The lighting apparatus of Claim 51, wherein the mount tab is angled about 33° relative to the body of the base plate.

53. (Previously Added) The lighting apparatus of Claim 48, wherein the LED module comprises a thermally-conductive base member attached to a second side of the dielectric sheet, and the base member is directly attached to the mount tab.

54. (Previously Amended) An illuminated signage system, comprising:

at least one channel defined by a plurality of wall surfaces and a back surface;

a translucent material extending over the channel; and

a plurality of light emitting diode (LED) modules disposed within the channel and arranged on at least one of the channel surfaces; the LED modules being electrically connected to one another in parallel, each of the LED modules comprising:

a plurality of LEDs, each LED having at least one lead; and

a circuit board, comprising a thin dielectric portion, and a plurality of electrically-conductive contacts on a side of the dielectric portion, each of the plurality of contacts being configured to mount a lead of an LED such that the plurality of LEDs are electrically connected;

wherein the LED modules that are attached to the at least one channel surface are mounted so that the dielectric portion is disposed between the channel surface and the plurality of contacts, and the channel surface is in thermal communication with the plurality of contacts through the dielectric portion so that heat is transferred from the LED module to the channel surface.

55. (Previously Amended) The signage system of Claim 54, wherein each of the LED modules additionally comprise a thermally conductive base member connected to a second side of the dielectric portion, the base member comprising a generally flat mounting surface configured to be connected to the channel surface.

56. (Previously Added) The signage system of Claim 54, wherein each of the plurality of LED modules additionally comprises a reflective layer disposed atop the module so that the module is configured to direct light from the LED in a direction generally coplanar to the contacts.

57. (Previously Amended) The signage system of Claim 56, wherein the LED modules are arranged so that light from the LEDs is directed toward the wall surfaces and bottom surface.

58. (Previously Amended) The signage system of Claim 57, wherein the wall surface and bottom surface are coated with a diffusely-reflective coating.

59. (Previously Amended) An illuminated signage system, comprising:

at least one channel defined by a plurality of walls, a back surface, and a front, at least a first one of the walls being thermally conductive, the front comprising a translucent material;

at least one lighting module comprising a plurality of light emitting diodes (LEDs) arranged in series on a thermally conductive base;

wherein the at least one module is mounted on the thermally conductive first wall and arranged so that the LEDs do not directly illuminate the translucent front of the channel, and so that heat from the LEDs flows from the module to the thermally conductive first wall.

60. (Previously Added) The signage system of Claim 59, wherein the at least one module comprises a plurality of LED packages and a circuit board, each package comprising an LED and at least one lead, the circuit board comprising a thin dielectric sheet and a plurality of electrically-conductive contacts disposed on a first side of the dielectric sheet, each of the contacts being configured to mount a lead of an LED package such that the plurality of LEDs is series connected.

61. (Previously Added) The signage system of Claim 60, wherein the circuit board is generally planar and comprises a generally flat mounting surface so that the module has a low profile when mounted on the first wall.

62. (Previously Amended) The signage system of Claim 60, comprising a plurality of modules arranged along the thermally conductive first wall so that the LEDs do not directly illuminate the translucent front.

63. (Previously Added) The signage system of Claim 62, wherein the plurality of modules are arranged electrically in parallel relative to one another.

64. (Previously Amended) A light emitting diode (LED) module for mounting on a heat conducting surface that is substantially larger than the module, the module comprising:

a plurality of LEDs;

a thin dielectric portion;

a plurality of electrically-conductive contacts on a first side of the dielectric portion, each of said plurality of contacts being configured to mount an LED such that said plurality of LEDs are electrically connected to one another; and

a heat conductive body on a second side of said portion, said body having a first side in thermal communication with the plurality of contacts through said dielectric portion, said first side of said body having a surface area substantially larger than a contact area between the contacts and the dielectric portion, a second side of said body having a surface complementary to the heat conducting surface to provide thermal contact with the heat conducting surface, whereby heat is transferred from the LEDs to the heat conducting surface.

65. (Previously Added) An LED module as in Claim 64, wherein the surface of the second side of the body is generally flat.

66. (Previously Added) An LED module as in Claim 65, wherein the contacts are substantially flat and coplanar relative to each other.

67. (Previously Added) An LED module as in Claim 66, wherein the body is substantially flat and parallel to the contacts.

68. (Previously Added) An LED module as in Claim 64, wherein the heat conducting surface behaves as a heat sink.

69. (Previously Amended) An LED module as in Claim 64, wherein the dielectric portion comprises an epoxy.

70. (Previously Added) An LED module as in Claim 64, wherein the body has a thermal conductivity greater than about 100 W/mK.

71. (Previously Added) An LED module as in Claim 70, wherein the body comprises a metal.

72. (Previously Added) An LED module as in Claim 71, wherein the body comprises aluminum.

73. (Previously Amended) A channel illumination device comprising a plurality of the LED modules of Claim 64 in combination with at least one channel defined by a plurality of

wall surfaces and a back surface, wherein the LED modules are mounted on at least one of the surfaces of the channel illumination device.

74. (Previously Added) A channel illumination device as in Claim 73, wherein the plurality of LED modules are electrically connected in parallel relative to each other.

75. (Previously Amended) A channel illumination device as in Claim 73, wherein the at least one channel surface comprises a heat conducting surface.

76. (Previously Amended) An illuminated sign, comprising:

a body of thermally conductive material having a thermal conductivity greater than about 100W/mK, said body having a periphery in the shape of an element of said sign; and

a plurality of light emitting diode (LED) modules disposed on an interior side of said body, the LED modules being electrically connected to one another in parallel, each of the LED modules comprising:

a plurality of LEDs;

a thin dielectric member; and

a plurality of electrically-conductive contacts on a side of the dielectric member, each of the plurality of contacts being configured to mount an LED such that the plurality of LEDs are electrically connected;

wherein each of the LED modules that are attached to the body are mounted so that the dielectric member is disposed between the body and the plurality of contacts, and the body is in thermal communication with the plurality of contacts through the dielectric member so that heat is transferred from the LED module to the body.

77. (Previously Amended) An illuminated sign as in Claim 76, wherein the dielectric member is substantially planar.

78. (Previously Added) An illuminated sign as in Claim 77, wherein the contacts are substantially flat and coplanar relative to each other.

79. (Previously Amended) An illuminated sign as in Claim 76 additionally comprising a thermally conductive member on a second side of the dielectric member.

80. (Previously Added) An illuminated sign as in Claim 79, wherein the thermally conductive member has a thermal conductivity greater than about 100 W/mK.

81. (Previously Added) An illuminated sign as in Claim 80, wherein the thermally conductive member is substantially rigid.

Please add the following new claims:

82. (New) An illuminated signage system, comprising:

at least one channel defined by a plurality of wall surfaces and a back surface; and

a plurality of light emitting diode (LED) modules disposed within the channel and arranged on at least one of the channel surfaces, the LED modules being electrically connected to one another in parallel, each of the LED modules comprising:

a plurality of LEDs, each LED having at least one lead; and

a circuit board, comprising a thin dielectric portion, and a plurality of electrically-conductive contacts on a side of the dielectric portion, the plurality of contacts being configured to mount respective leads of an LED such that the plurality of LEDs are electrically connected;

wherein the LED modules that are attached to the at least one channel surface are mounted so that the channel surface is in thermal communication with the plurality of contacts so that heat is transferred from the LED module to the channel surface.

83. (New) The illuminated signage system of Claim 82 additionally comprising a translucent material extending over the channel.

84. (New) The illuminated signage system of Claim 82, wherein the dielectric portion is disposed between the channel surface and the plurality of contacts.

85. (New) The illuminated signage system of Claim 82, wherein the circuit board comprises a generally flat surface generally complementary to a channel surface.

86. (New) The illuminated signage system of Claim 82, wherein the circuit board is bendable.

87. (New) An illuminated signage system, comprising:

at least one channel defined by a plurality of wall surfaces and a back surface; and

a plurality of light emitting diode (LED) modules disposed within the channel and attached to at least one of the channel surfaces, the LED modules being electrically connected to one another in parallel, each of the LED modules comprising:

a plurality of LEDs;

a circuit board comprising a dielectric portion, the LEDs disposed on a first side of the dielectric portion and arranged such that the plurality of LEDs are electrically connected in series; and

a heat conductive metal on a second side of the dielectric portion, which heat conductive metal draws LED-generated heat from the first side for dissipation in the channel.

88. (New) The illuminated signage system of Claim 87, wherein the circuit board is interposed between the LEDs and the channel surface.

89. (New) The illuminated signage system of Claim 87, wherein a translucent diffuser extends over the channel.